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HONOLULU LABORATORY

Honolulu, Hawaii

INSULAR RESOURCES INVESTIGATION

Japanese Scientist Participates on Research Cruise

Dr. Takashi Sasaki of the Far Seas Fisheries Research Laboratory, Shimizu, Japan, spent 4 weeks at the Honolulu Laboratory working with Dr. George W. Boehlert, Chief, Insular Resources Investigation, and the staff of the Seamount Resources Study. During the 1970s, Sasaki worked on the biology and dynamics of seamount fisheries resources when the Japanese had an active fishery for the pelagic armorhead, Pseudopentaceros wheeleri, and the alfonsin, Beryx splendens. Several of his publications have been important to the Honolulu Laboratory's seamount research program. During his visit, Sasaki spent 2 weeks on the NOAA ship Townsend Cromwell on a cruise (TC-85-04) to the Hancock Seamounts. He observed the sampling procedures currently in use and made recommendations. After returning to the Laboratory, Sasaki spent an additional 2 weeks working with Boehlert on the pelagic distribution of armorhead in the North Pacific Ocean. Past catch records based upon Japanese, United States, and Canadian data (longline, gill net, plankton and whale stomach) are being examined to assess interannual variability in distribution and abundance of this species. (G. W. Boehlert (808) 943-1221)

Simplified Test for Ciguatoxin Evaluated

A simplified, rapid immunoassay for detecting ciguatoxin is being used in Hawaii to test fish flesh for toxicity. The immunoassay was developed by Dr. Yoshitsugi Hokama of the University of Hawaii. In this "stick test," coated skewers are inserted into the flesh and run through a series of solutions to produce a colorimetric indication of toxicity. The test, if reliable, would provide a means of preventing the ciguatera seafood poisonings which are a problem throughout subtropical and tropical regions such as Florida, Hawaii, Puerto Rico, Virgin Islands, and American Samoa. An independent field evaluation of this test was conducted by Paul L. Jokiel, Acting Leader of the Fisheries Habitat Research Program, and Research Assistant Matthew T. Wilson at Midway Island in the Northwestern Hawaiian Islands. Continual outbreaks of fish poisonings have occurred in this area.

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A total of 239 fish (34 species) were tested with the stick test. Also, samples (100 g) of flesh were frozen and returned to Honolulu for direct analysis of toxicity using a mouse bioassay. An extract was prepared and injected into mice (toxic samples will kill a mouse in less than 24 hours). The results, which will be reported in an Administrative Report (in preparation) are summarized as follows:

1. A number of modifications were recommended in the test for use in remote field situations. This test will have to be modified and evaluated further before it can be used in commercial applications.

2. The initial evaluation was very encouraging in spite of technical problems that might have reduced its accuracy. The stick test and the mouse bioassay tested negatively for species such as the mullet, Mugil cephalus, and the aholehole, Kuhlia sandvicensis, that are routinely eaten by the local population. The parrotfish, Scarus perspicillatus, showed extremely high toxicity by the stick test and the mouse bioassay.

3. Inconsistent results also were noted. Discrepancies were probably a result of polyethers other than ciguatoxin that are present in some of the fish. This problem is currently the focus of research in several laboratories and there is hope that it will be resolved. (G. W. Boehlert (808) 943-1221)

FISHERY MANAGEMENT RESEARCH PROGRAM

Spiny Lobster Fishery Analyzed

Dr. Robert A. Skillman, Leader, Fishery Management Research Program, Samuel G. Pooley, Industry Economist, Gary L. Kamer, Statistician, and Research Assistant Wesley K. Higuchi analyzed the relationship between the carapace lengths and tail widths of spiny lobster, Panulirus marginatus. They tested for differences in samples among islands, sexes, and differences in functional forms. Spiny lobsters with tail widths (measured at the new site TW3) of 5.1 cm were, on the average, equivalent to lobsters that are 7.7 cm, the existing carapace length regulation; lobsters with tail widths of 4.8 cm were, on the average, equivalent to lobsters with a 7.0 carapace length. The relationships were used by the spiny lobster planning team of the Western Pacific Regional Fishery Management Council (Council) to recommend a new size regulation for the Northwestern Hawaiian Islands (NWHI) spiny lobster fishery. The Scientific and Statistical Committee of the Council followed this recommendation and proposed the 5.1 cm (TW3) tail width for the fishery; however, at its recent meetings in August, the Council voted on a smaller tail width (4.8 cm) based on economic considerations.

Additionally, semiannual reports were prepared on the status of the NWHI spiny lobster fishery. Landings of spiny lobsters have risen by 50% in the first half of 1985 (compared with the first half of 1984), although the amount of fishing effort (trap-nights) has increased substantially

(450%). The effect is evident in a drop in spiny lobster catch rates. At the same time, landings of slipper lobsters, Scyllarides squammosus and S. haanii, by the fishery have increased dramatically (10x). Midyear landing totals were 260,000 legal spiny lobsters and 680,000 slipper lobsters. Fourteen different vessels expended 410,000 trap-nights of effort in 31 trips. The catch rates were 0.61 for legal spiny lobsters and 1.64 for slipper lobster. The spiny lobster planning team concluded that although the spiny lobster stock appears to be in reasonably good biological condition (the catches are within the maximum sustainable yield range projected by the fishery management plan), the declining catch rates and lower prices commanded by slipper lobsters pose substantial commercial problems. (R. A. Skillman (808) 943-1221)

Summer Faculty Fellow Completes Stay in Hawaii

Dr. Linda L. Hudgins of the University of Notre Dame completed a 2-month stay at the Honolulu Laboratory as a summer faculty fellow. During her stay, Hudgins analyzed multi-product fishery problems using linear programming analysis. Research Assistant Wesley Higuchi aided Hudgins by implementing a linear programming model on the CompuPro microcomputer and will test hypotheses that she proposed. Her final report on this activity will be prepared later in the year.

Hudgins also completed a paper, "Economic Issues of the size distribution of fish caught: Hawaii skipjack tuna catches 1964-82." Before 1973-74 the catch of large skipjack tuna comprised 64% of the landings in Hawaii, while in the following years its share fell to 36%. Hudgins investigated a number of biological and economic possibilities for this decline, and concluded that fuel price increases may have contributed to a loss of $1.3 million in landings due to reduced search time. About $1 million per year is lost due to the absolute decline in catches, and approximately $300,000 is lost due to declining size distribution, both attributable to fishing activity elsewhere in the Pacific. However, if larger numbers of smaller fish had not replaced the large fish, the loss attributed to changing size composition would have been $1.2 million. Hudgins concluded that, "it appears most likely that the stock is being truncated before it ever reaches Hawaii waters," and that "it will be increasingly difficult for the skipjack tuna industry in Hawaii to expand without some change in technology or expansion of markets." (S. G. Pooley (808) 943-1221)

Western Pacific Fisheries Information Network (WPACFIN) Capabilities at Guam and Saipan Updated

David C. Hamm, Computer Systems Analyst, visited the Division of Aquatic and Wildlife Resources (DAWR) in Guam and the Division of Fish and Wildlife (DFW) in Saipan to update the WPACFIN capabilities of these agencies. During his visit, he completed specification and design of an update to the Guam Offshore Expansion System to improve the flexibility of file input-output routines to better interface with a new fishing derby data utility also under development; and he completed final specification and design of the derby data update utility, including design of formats for four special reports. He also designed and implemented a tournament

data base at DAWR, beta-tested the Guam Inshore Expansion System and developed specifications for the Summary Report Series that will be prepared by WPACFIN participants. (D. C. Hamm (808) 943-1221)

PELAGIC RESOURCES INVESTIGATION

Physiological Condition and Viability of Yellowfin Tuna Examined

Dr. Christofer H. Boggs, Fishery Biologist, has been examining the metabolic performance of yellowfin tuna, Thunnus albacares, and investigating the effects that nutritional history may have on tunas' viability. This investigation, which is being conducted in cooperation with Dr. Elizabeth Vetter of the Oceanic Fisheries Resources Division in La Jolla, California, is designed to provide an index of changes in natural mortality. Initial results suggest that fasting reduces the tolerance of yellowfin tuna to low oxygen concentrations. Resistance times of 72 minutes at 2.0 ppm and 44 minutes at 1.75 ppm (at 24°C) were measured in two fish that had not been fed for 16 days. In contrast, a well-fed yellowfin tuna survived for 87 minutes at 1.75 ppm and recovered to feed again a day later. It was then tested again at 1.5 ppm, which resulted in a resistance time of 99 minutes. In general, this tolerance is much greater than that measured in skipjack tuna, Katsuwonus pelamis. Oxygen consumption rates of free-swimming yellowfin tuna were measured for the first time. The measurements ranged from 0.5 to 0.7 mg of oxygen/gram fish/hour which is very similar to rates for free-swimming skipjack tuna.

In related work the non-bicarbonate buffering capacity of "burnt" and good quality yellowfin tuna white muscle was examined. Buffering capacity ranged from 104 to 118 slykes with no clear trend in relation to muscle quality. Recent work on yellow perch using more rigorous techniques, however, indicates clear differences between well-fed and starved fish. (C. H. Boggs (808) 943-1221)

DATA MANAGEMENT AND TECHNICAL SERVICES

Port Selector Installed at Honolulu Laboratory

A 9021 Develcon Port Selector, installed at the Honolulu Laboratory in August, has enabled the staff at the Laboratory to make more efficient use of its Molecular computer and, in addition, link computer resources to a greater number of users.

A port selector serves the same function as a telephone switching system: system components (in this case terminals, computer ports, modems, and printers) can be connected to a switch, eliminating the need for direct wiring between each component. The previous direct wiring of terminals to Molecular processors was not very efficient since nearly one-third of all ports were not in use at any given time during the day. Use of the port

selector allows more terminals to be added to the Molecular system without the need for additional processors.

With the port selector, laboratory personnel may now access several computer resources previously available only to those directly connected to the resource. Users may opt for connection to the University of Hawaii's computing center, use of a modem, or use of a Molecular port. Future plans are to link other hardware resources (printers, plotters, and networked microcomputers) to the "Devel switch" so that this equipment, too, may be shared and more efficiently used throughout the Laboratory. (F. V. Riggs (808) 943-1221)

COASTAL FISHERIES RESOURCES DIVISION
La Jolla, California

COASTAL EASTERN PACIFIC POPULATION BIOLOGY OF FISHES

Gastric Evacuation of 23 mm Anchovy Larvae in Mackerel Stomachs Studied

The gastric evacuation of anchovy in mackerel stomachs has been under study as part of a larger study to assess the effect of predation by Pacific mackerel on the northern anchovy stock. Eric Lynn, Biological Technician, recently completed an experiment on the gastric evacuation of larval anchovy in mackerel stomachs (temperature, 16.9-17.7°C). Eight individually-marked mackerel were fed by hand pre-weighed anchovy larvae (mean standard length = 23 mm) which had been reared in the laboratory. The mackerel were sacrificed from 0.35 to 1.9 hours after feeding, and digested larvae were removed from the stomach and re-weighed. About 50% of the food was lost only a half hour after feeding, and less than 10% remained after 2 hours (mean instantaneous evacuation coefficient = 1.22, s = 0.89, N = 8). This rate of evacuation is much higher than the rate at which mackerel evacuate juvenile anchovy (55 mm SL) or adult anchovy (92 mm). Juvenile anchovy were evacuated at the same rate as adults with a 50% loss occurring about 10 hours after feeding; about 17% of the meal remained in the stomach after 24 hours (average evacuation coefficient for juvenile and adult anchovy = 0.074, s = 0.00305).

The larvae were identifiable as northern anchovy for even shorter periods. After 30 minutes, about half the larvae were identifiable, but after an hour none could be identified from gross anatomical examination. The larvae used in this study were relatively large (23 mm) and smaller larvae would presumably be digested and become unidentifiable after even shorter periods. Larvae might be identified for longer periods if they were inside a large bolus of other foods, however. The period during which larvae could be identified in mackerel stomachs could be extended if their otoliths or immunoassay techniques were used for identification.

This study indicates that conventional methods of stomach content analysis probably cannot be used to make a quantitative estimate of predation by mackerel on any larval stage of anchovy. Even large larvae seem to be digested and evacuated very rapidly, possibly because of their lack of scales and thin epidermis. Mackerel taken in the purse seine fishery may be inappropriate for an assessment of rates of predation on larvae because the time it takes to capture and freeze fish probably exceeds the duration the larvae remain in the stomach. Immunoassay techniques could be used to extend the period larvae could be identified, but the mackerel would have to be captured and frozen more rapidly than is the case in the fishery. (J. Hunter, FTS 893-6220)

COASTAL EASTERN PACIFIC FISHERIES ENVIRONMENTAL INVESTIGATIONS

Satellite Remote Sensing Used to Help Fishermen Find Albacore

The Southwest Fisheries Center is a leader in research on the applications of satellite remote sensing in fisheries. Among the accomplishments of scientists at the Center is the finding that the distribution and availability of albacore tuna off the west coast of the U.S. are related to oceanic fronts seen in ocean temperature and color measurements made by satellite. Commercially fishable aggregations of albacore are found in warm, blue oceanic waters near temperature and color fronts on the seaward edge of coastal water masses. These oceanic boundary features, which result primarily from coastal upwelling, are clearly observable in satellite imagery collected along the U.S. Pacific coast. To help albacore fishermen locate potentially productive fishing grounds, ocean color boundary charts are distributed to West Coast fishermen via radio facsimile and by mail by the NOAA National Ocean Service in cooperation with the Southwest Fisheries Center. These charts are derived from measurments made by the Coastal Zone Scanner on board the NIMBUS 7 satellite.

Scientists at the Center have also demonstrated that the northern spawning area of northern anchovy can be delimited using satellite infrared ocean temperature measurements, and that the southern limit of spawning may be defined using satellite ocean color measurements. Satellite remote sensing has been an especially important tool during the recent El Niño for monitoring anomalous ocean conditions along the U.S. Pacific coast. Scientists at the Center also use satellite measurements to assist in the design of fisheries research field studies and to guide research operations on fishery research vessels at sea. (M. Laurs, FTS 893-6274)

Dr. R. Michael Laurs, Oceanographer, expert in the application of satellite remote sensing to fisheries, views a satellite image received by radio facsimile onboard the F/V Barbara H.

SURVEY SYSTEMS DEVELOPMENT AND EVALUATION

CalCOFI Oceanographic Data Base Updated through 1984

The primary file of oceanographic data, which is maintained at SWFC for the network of stations in the CalCOFI grid, is the standard depth file. It contains values of temperature, salinity, oxygen, sigma-t (density), percent of oxygen saturation, and dynamic height anomaly for 14 standard depths from the surface to 500 meters. Through the cooperation of Arnold Mantyla (Marine Life Research Group, Scripps Institution of Oceanography) and Ken Bliss, Oceanographer, who contributed copies of processed oceanographic data from recent CalCOFI cruises, oceanographer Larry Eber has updated the standard depth file through October 1984.

The updated file includes data from 200 CalCOFI cruises conducted from 1950 through 1984. Information on the contents of the standard depth file is available in an index file on the UCSD VAX computer (sdcc1). The index file contains the dates and stations on which oceanographic casts were made for each cruise. The index file can be viewed by running the program:

UDISK13:[NM13]HYDROINDX.

A package of utility programs to access, maintain and update the standard depth oceanographic file is currently being modified and reorganized to provide more convenient and efficient use of the file. (L. Eber, FTS 893-6282)

COMMERCIAL AND RECREATIONAL FISHERIES RESEARCH FOR MANAGEMENT

Methot-Isaacs-Kidd Frame Trawl Tested

A new micronekton sampler designed by fishery biologist Richard Methot was tested successfully on board the NOAA Ship David Starr Jordan. The new net, a modification of the Isaacs-Kidd midwater trawl, is designed to sample juvenile fish throughout the midwater column and immediately below the sea surface. The Methot-Isaacs-Kidd (MIK) frame trawl (Figure 1) differs from the Isaacs-Kidd midwater trawl in three ways. First, the MIK has a rigid square frame that remains vertical at all tow speeds; this characteristic improves the accuracy of the measurement of volume filtered. Second, the Isaacs-Kidd depressor is moved from the lower edge of the

Figure 1. Methot-Isaacs-Kidd trawl hoisted and ready for deployment.

mouth of the net to a position behind and below the mouth; this change and the simple tow bridle attachment to the frame should greatly reduce the fishes' ability to detect the approaching net. Third, the depressor is not an integral part of the MIK frame trawl; when it is removed, floats can be attached and the sampler can be towed immediately below the water's surface.

A prototype of the MIK frame trawl was tested successfully in January 1985. A full-size version was constructed this summer and tested on July 29-30.

With the depressor attached, oblique tows were made from a depth of 50 m to the surface. With the floats attached, the net was towed at the surface 100 m behind the vessel. In both configurations the net was easy to deploy and retrieve. Several juvenile and adult fish were captured in surface and oblique tows conducted along the coast north of San Diego, but a more extensive trial is required to calibrate the catching power of this net relative to larger trawls. A SWFC Administrative Report describing the MIK frame trawl is in preparation. (R. Methot, FTS 893-6225)

Optimal Pacific Trawl Fleet Investigated

Industry economists Daniel Huppert and Dale Squires are investigating a linear programming model of the Pacific trawl fleet. They have implemented a prototype model on the UCSD VAX computer, and the model is now being transferred to a microcomputer for further development. The model examines the profit-maximizing allocation and level of fishing effort among geographical areas, seasons, and vessel size classes for groundfish (various species), shrimp, crab, and the whiting joint venture fishery. From the model it is possible to estimate the optimal allocation for an arbitrary fleet, such as the present fleet; the model also examines the optimal number of vessels by size class. Vessel-level cost data and catch rates were extracted from the PACFIN Research Data Base. The results of the linear programming model will be used to support a study of limited entry possibilities in the Pacific trawl fleet. (D. Huppert, FTS 893-6261)

Aerial Fish Spotters Logbook Observations Calibrated

Statistician Andy Bindman continues to develop the statistical basis of a method which may be used to estimate year-to-year changes in abundance of anchovy and other coastal pelagic fishes. The data used in the project are estimates of anchovy school weights from the logbooks of aerial fish spotter pilots (airplane pilots who locate fish schools for the commercial fishing boats). These school size estimates are subjective and vary greatly among pilots. For example, two pilots, when observing schools of similar size (inferred by comparing observations made at the same location and time), may consistently differ in their estimates of weight by as much as one-hundredfold.

In the first stage of this project, Bindman removed this source of error by standardizing the pilots' observations. One pilot who has an extensive record of observations was arbitrarily chosen as the standard pilot, and the calibration factors, or "sighting powers" (by analogy to

fishing power in standard logbook analysis) for each of the remaining pilots were computed. A pilot's sighting power is the ratio of the average of his school size estimates to the average of the standard pilot's estimates when both are looking at schools which are from a similar size distribution. In the next stage, Bindman will divide each pilot's school size estimates by the pilot's sighting power to give him an effective sighting power equal to that of the standard pilot. No useful information will be lost by this standardization because the final product will be a relative index of year-to-year changes in anchovy abundance and not an absolute measure of abundance. Moreover this approach should allow each pilot to have a potentially equal influence on the abundance index, making full use of the information in the various spotters' logbooks.

The sighting powers for the 15 pilots participating in the logbook program are shown in Figure 2. In this case the standard pilot is pilot number 5, who is assigned a sighting power of unity. The sighting power of pilot number 13 may be imprecise since he had few sightings (standard errors of these sighting powers are being estimated by a jack-knife procedure). Pilots 3 and 5 are brothers, and their sighting powers are similar.

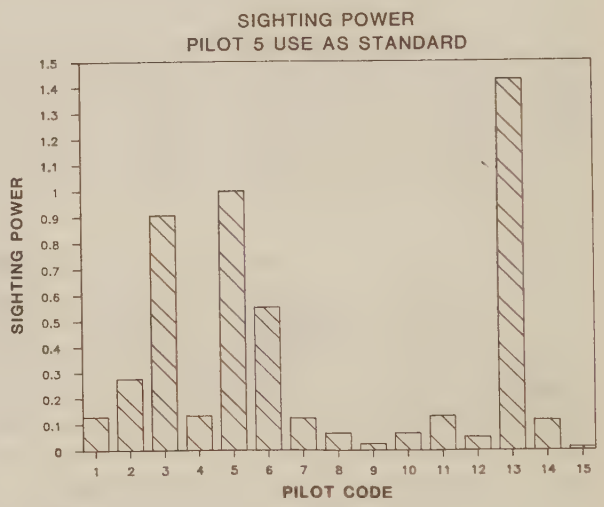

Figure 2. Sighting powers for the 15 pilots.

The project will be completed with a statistical treatment of the adjusted school size data. A general linear model (ANOVA) will be used to account for major factors, including year-to-year changes in anchovy abundance, that produce the variability in the time series of adjusted school size observations. The year-to-year changes will be an index of anchovy stock abundance. (A. Bindman, FTS 893-6309)

OCEANIC FISHERIES RESOURCES DIVISION
La Jolla, California

ECOLOGICAL FISHERY SYSTEMS INVESTIGATIONS

1984 U.S. Tuna Trade Summarized

Dr. Samuel Herrick, Industry Economist, and Steve Koplin, Fishery Reporting Specialist at the Southwest Region, have co-authored a Southwest Region Administrative Report entitled "U.S. tuna trade summary, 1984." The report reviews harvesting and processing for the U.S. tropical tuna and albacore fisheries during 1984.

1984 was a year of frustration and disappointment for much of the U.S. tuna industry. As the year ended, the only continental U.S. tuna cannery remaining in operation was Pan Pacific Packers located at Terminal Island, California. Two California canneries, Van Camp and Starkist, had shut down their mainland operations leaving approximately 2,400 cannery workers without jobs. The cannery closures, together with a 20-30% decline in ex-vessel prices, also had an impact on a significant number of California-based vessels: 10 transferred flag, 9 were chartered to foreign interests, and a few were even converted for operation in the North Pacific trawl fisheries. By the end of the year, the U.S. tropical tuna fleet experienced a 12% decline.

According to the U.S. tuna industry, foreign competition was the most significant factor contributing to the cannery closures and economic problems of the U.S. fleet during 1984. From 1979 through 1984 the amount of canned tuna imported into the U.S. more than tripled, increasing by almost 40% between 1982 and the end of 1983 alone. This increase has consisted almost entirely of tuna canned in water which has surpassed tuna packed in oil in popularity among U.S. consumers, and which is subject to a much lower import tax than tuna packed in oil.

With the cannery and vessel dislocations that occurred during 1984, domestic cannery receipts of imported and domestically-caught albacore and tropical tunas (skipjack, yellowfin, blackfin, bluefin and bigeye tuna) were slightly below those for 1983. The total volume was 524,028 short tons (tons) a decrease of less than 2% from 1983, which is also 8% below the 1979-1983, 5-year average volume of annual cannery receipts. Domestically-caught cannery deliveries amounted to 254,581 tons, 11% below the 1983 level but 3% above the 1979-1983 average. Imports made up the 269,447 ton balance in total cannery supplies for 1984, a 9% increase in raw tuna imports from 1983, but 16% below the 1979-1983 average.

Among the significant events of 1984 was the increase in deliveries of U.S.-caught tropical tuna to foreign canneries. Vessels of the U.S. fleet landed 29,570 tons of tuna for export, most of which was transshipped to Thai, Japanese and Italian canneries. This compares to only 583 tons exported in 1983, and a 1979-1983 average of 2,888 tons. When domestically-caught raw tuna exports are combined with domestically-caught deliveries to

U.S. canneries, total U.S. deliveries amounted to 284,151 tons for 1984, less than 1% below the amount for 1983.

The western Pacific Ocean remained the most productive tuna fishing area for U.S. vessels during 1984, accounting for 188,000 tons, or 66% of total domestically-caught U.S. cannery receipts and U.S. exports of raw tuna by oceanic area. This represents a 10% increase from 1983, and is three times the 1979-83 average volume of annual domestically-caught cannery receipts and raw tuna exports from this area.

Despite the loss in west coast processing capacity and intense competition from foreign producers, which resulted in a record level of canned tuna imports, overall U.S. canned tuna production in 1984 rose 4% from 1983. Total volume was 31.0 million standard cases, 3% above the 1979-83 average total annual volume. When canned imports are combined with U.S. production, the total addition to U.S. canned supplies was 39.4 million standard cases for 1984 which is 8% above 1983 and 15% above the 1979-83 average annual additions to canned supplies.

Increased competition between foreign and domestically produced canned tuna has favored U.S. consumers. The retail composite canned tuna price, which decreased nearly 7% during 1983, fell an additional 3% in 1984. The downward price trend has contributed to corresponding growth in overall consumption which increased 2% in 1984, following an increase of 7% for 1983. Water packed products led sales in all categories during 1984, with a gain of almost 10% from 1983. Since water packed products account for more than 60% of total sales, this increase helped offset the reduced sales of light tuna in oil and health oriented canned tuna products which occurred in 1984. (S. Herrick, FTS 893-6206)

MARINE MAMMAL ASSESSMENT INVESTIGATIONS

Staffs of Southwest and Northwest Fisheries Centers Cooperate to Study Foraging Behavior of Coastal Pinnipeds

LCDR Wayne Perryman (SWFC) and George Antonelis (National Marine Mammal Laboratory, Northwest and Alaska Fisheries Center) recently completed a study designed to determine the principal feeding areas for the California sea lions (Zalophus californianus) and northern fur seals (Callorhinus ursinus) that use the rookeries at Pt. Bennett, San Miguel Island. This effort is part of a continuing program at both Centers to monitor the feeding habits of these populations that consume an estimated 50,000 tons of anchovy, hake, rockfish, and squid each year.

Radio tags were attached with a quick drying epoxy to the pelage on the head of 25 parturient females of each species. The frequency of each transmitter was unique, allowing the activity patterns of individuals to be monitored. An observer on the island scanned all 50 frequencies four times daily to determine when each animal departed the rookery for the open sea to feed and when each returned. The distribution of tagged animals at sea

was determined by flying a series of transects with an aircraft equipped with radio tracking antennas.

Preliminary results from the study indicate that the two species differ markedly in foraging strategy. Feeding bouts for sea lions average about 2 days. These animals were most frequently found in waters over the 100 fathom curve. The average feeding bout for fur seals was approximately 7 days. Individuals were most often located in waters deeper than 200 fathoms. (W. Perryman, FTS 893-6295)

BIOLOGICAL SYSTEMS INVESTIGATIONS

Staff Scientists Participate in International Congress

Wildlife biologist Dr. Al Myrick and zoologist Aleta Hohn recently returned from Edmonton, Alberta, Canada, where they attended the Fourth International Theriological Congress, a conference on mammalian biology which was held at the University of Alberta from August 13 to 20. About 900 scientists from 58 countries and hundreds of other interested persons attended the conference; nearly 650 papers and posters were presented and a number of films were shown on genetics, behavior, functional morphology, paleontology, systematics, reproductive biology, population dynamics, physiology, biogeography, age determination, conservation and management, and ecology of mammals.

Highlights of the conference for Myrick and Hohn were the discussions, demonstrations and workshop on age determination. Hohn and Myrick worked with the workshop convener, Gary Matson (Milltown, Montana) in planning the format for the discussion period and engineering activities for the extended demonstration session which was held before and after the presentation and discussion of papers. During formal sessions, Hohn gave an invited paper, coauthored by Myrick, Hohn, Wells, Scott and Irvine, entitled: "Dentinal growth layer similarities in captive and wild known-age bottlenose dolphins, Tursiops truncatus." She reported that 1) dentinal layering patterns and deposition rates calibrated from captive animals can be used to accurately age dolphins from the same population in the wild, and 2) environmental factors, whether in the wild or in captivity, apparently do not measureably alter the patterns or their depositional rates. This study, the first of its kind, is important in addressing the question of the legitimacy of using calibrations from captives for estimating ages of wild specimens.

The several hours set aside for formal discussion of techniques, problems, and research directions and goals were especially productive. Among the initiatives considered by the discussion participants were resolutions to investigate the causes and factors influencing layering patterns in hard tissues of mammals and to recommend that an expanded symposium on age determination of mammals be held at the next theriological congress when it convenes in Rome in 1989.

During the demonstrations, Hohn and Myrick described exploration of methods at the SWFC to calibrate and examine teeth for estimating age and

for making physiological and phylogenetic interpretations from dental patterns. Myrick noted that a number of alternative methods demonstrated by fellow participants may prove useful as independent checks to age estimates of marine mammals. He plans to examine some of these methods for use on dolphins. (A. C. Myrick, FTS 893-6335)

TUNA/BILLFISH ASSESSMENT INVESTIGATIONS

California State Record Set for Striped Marlin

James Squire, Fishery Biologist, recently assisted in identifying a record-size, striped marlin caught by a sport fisherman (Figure 3). The fish was caught on July 4, 1985, by Gary Jasper of Capistrano Beach in waters southwest of Avalon, Catalina Island, California. According to the California Department of Fish and Game, which maintains size records for recreational species caught off California, this is the largest striped marlin landed in California (339 pounds, 9 feet 9-7/8 inches in length).

To qualify for a record the species of fish must be certified by a fishery biologist; Squire officially indentified the fish on July 9, 1985 as a striped marlin. After identification the fish was prepared for mounting, which included removal of all internal organs. Its stomach contained 16 Pacific mackerel, each about 11 inches in length.

Figure 3. James Squire (left) examines record-size striped marlin as Gary Jasper looks on.

The largest striped marlin in the Pacific are most frequently caught off New Zealand where the world all-tackle recrod for striped marlin is 455.25 pounds set in 1982 off Mayor Island, New Zealand. Of the 17 International Game Fish Association records for striped marlin, only four are for fish caught in the eastern Pacific. (J. L. Squire, FTS 893-6376)

MULTI SPECIES DATA MANAGEMENT AND FISHERIES MONITORING

Cruise Tracks for Dolphin Surveys in the Eastern Tropical Pacific Designed with the Help of a Computer

Computer programmer analyst Ken Wallace, and computer programmer Joseph Joy, have developed a computer program, CRUZTRK, for planning and drawing research vessel cruise tracks. This program has been used by operations research analysts Rennie Holt and Stephanie Sexton to design tracklines of vessels for dolphin abundance surveys in the eastern tropical Pacific Ocean (ETP). CRUZTRK, a fully interactive program, has the capability to display simultaneously the following on a video screen: a chart, cruise tracks, reports of distance traveled and instructional menus. The user, with the aid of these menus and a joystick, can draw and edit up to 16 different cruise tracks. The trackline distance is continually updated and displayed. A warning is issued if a trackline exceeds the vessel's maximum range.

Upon request the user may generate and display a report showing distance traveled within six distinct oceanographic regions of the ETP. By using this report and the graphical editing features of the program the user may adjust the tracklines until the desired coverage of each region is obtained. Trackline data are stored on disk when the program is terminated and may be restored during subsequent program runs. The program uses a number of parameters to control different parts of the image display. The user may select default values of these parameters or customize them according to personal preference; parameter values are also stored on disk for later use.

CRUZTRK was developed on a VAX 11/780 computer and is written in FORTRAN-77. The program is designed to use a VT100-compatible terminal equipped with a TEKTRONICS 4010/4013-compatible graphics processor (with some manufacturer enhancements) and a joystick. CRUZTRK is relatively "stand-alone" as it is not dependent on any proprietary graphics software package; all video image generation is handled by the FORTRAN code. The program is adaptable for use with other regions of the world. (K. Wallace, FTS 893-6357)

PACIFIC FISHERIES ENVIRONMENTAL GROUP
Monterey, California

Ocean Thermal Workshop Held in Monterey

On July 9-10, oceanographer Douglas McLain helped the staff of the Fleet Numerical Oceanographic Center (FNOC) host an Ocean Thermal Workshop as part of the Tropical Ocean-Global Atmosphere (TOGA) Research Program. TOGA is a 10-year, international program on the relation of oceanographic events in the tropics to global climatic changes. Of primary importance to the program are changes in the winds, currents and heat content of tropical waters. To observe these conditions, members of TOGA will support an expansion of the ship of opportunity XBT program and an expansion of the island tide gage network. To process the resulting data, regional centers will be set up in areas where particular oceanographic expertise is available. For example, sea level data will be handled by a group at the University of Hawaii, headed by Dr. Klaus Wyrtki. During the program, particular emphasis will be on real-time data exchange via the IGOSS Global Telecommunications System.

At the Ocean Thermal Workshop, participants tentatively decided to handle ocean thermal data at two main centers: Scripps in La Jolla for the Pacific Ocean and ORSTOM in Brest, France, for the Atlantic and Indian Oceans. In addition, subcenters will be set up at: CSIRO in Hobart, Australia; ORSTOM in Noumea, New Caledonia; PMEL in Seattle, and FNOC in Monterey. The FNOC subcenter will emphasize collection and quality control of real-time (BATHY) reports of subsurface temperature. Most of the work at FNOC will be handled by contractors and will be funded jointly by TOGA and Naval Ocean Services.

NOTE: The name of the Pacific Environmental Group has been officially changed to the Pacific Fisheries Environmental Group.

TIBURON LABORATORY
Tiburon, California

GROUNDFISH ANALYSIS INVESTIGATION

Results of June Juvenile Rockfish Cruise Reported

Members of the Groundfish Analysis Investigation are currently investigating abundance and distribution of young-of-the-year (juvenile) rockfishes (species Sebastes) off the coast of central California. The third annual midwater trawl survey for juvenile rockfish, led by fishery biologists William Lenarz and Tina Wyllie Echeverria, was completed in June (NOAA Ship David Starr Jordan 85-05 [188]). The area between Point Sur and Point Cabrillo was surveyed from nearshore to 70 miles offshore. The cruise lasted 25 days, during which 100 midwater trawls were completed. Sorting and identification were done after each haul (Figure 4). Many of the juvenile rockfish landed were members of the "black dorsal spot" group, consisting of seven species including S. entomelas, S. flavidus, S. mystinus, S. melanops, and S. serranoides. It is very difficult to differentiate some of these species fin-ray and gill-raker counts under the microscope. About 85% of the S. entomelas were correctly identified at sea, although it was difficult to distinguish S. mystinus from S. flaviudus. The goal is to be able to identify the majority of rockfishes.

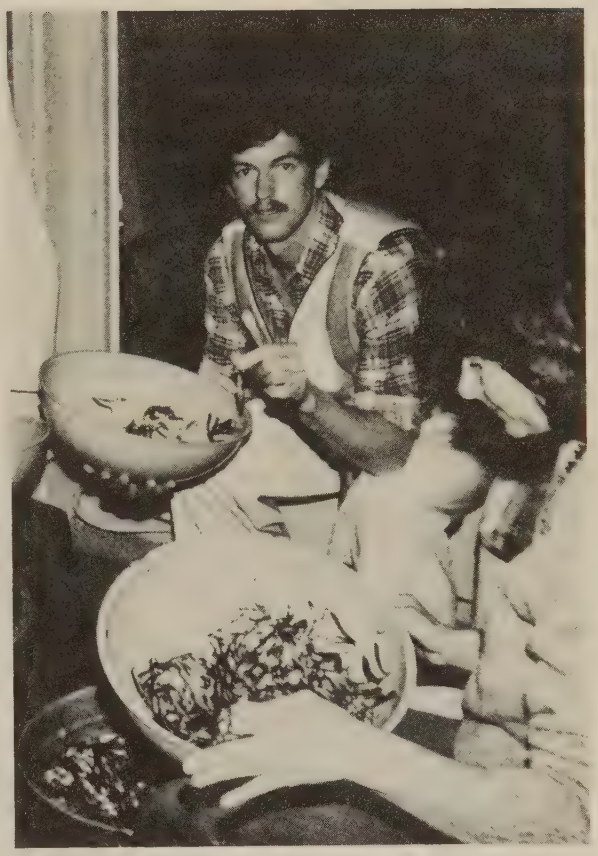

Figure 4. Tina Wyllie Echeverria (Cruise Leader) and David Woodbury (Biological Technician) sorting juvenile rockfish from the organisms landed in one haul.

Abundance, distribution, and species associations were investigated. Fifty-six trawls contained juvenile rockfish representing 13 species and 1,264 individuals (Table 1). Sebastes entomelas was the most abundant,

Table 1. Total number of rockfish, in order of abundance, landed by midwater trawl gear June 5-30, 1985.

Species	Total number of individuals	Species	Total number of individuals
S. entomelas	508	S. crameri	3
S. jordani	481	S. serriceps	3
S. flavidus	159	S. serranoides	2
S. mystinus	77	S. melanops	1
S. hopkinsi	19	S. wilsoni	1
S. pinniger	6	S. paucispinis	1
S. saxicola	3		

both in total numbers and frequency of occurrence, and S. jordani ranked a close second. In previous years, S. jordani was, by far, the most abundant species landed, with S. flavidus (1983) and S. paucispinis (1984) next in abundance. Usually juvenile rockfish occurred in a mixed species assemblage, most often associated with hake (in 28 of the 56 hauls containing rockfish) and with euphausids and sergestid shrimps (Table 2).

Table 2. Species associations from 56 midwater trawls containing juvenile rockfish, June 5-30, 1985.

Species	Total number of occurrences	Number of co-occurrences			
		S. entomelas	S. jordani	S. flavidus	S. mystinus
S. entomelas	38				
S. jordani	29	21			
S. flavidus	24	19	11		
S. mystinus	16	15	11	12	
S. hopkinsi	9	6	6	5	2
Merluccius productus	28	19	14	14	15
Euphausids	25	14	10	7	6
Sergestids	15	5	8	3	4
Pacific anchovy	7	4	3	5	2
Squid	6	4	2	2	2

The results of the June 5-30 cruise indicate that, although some species of rockfish had a longer reproductive period this year than in the previous 5 years, later spawning apparently was not as successful as earlier spawning. The results of the April and June 1-5 cruises of the Goundfish Communities Investigations led by fishery biologist Peter Adams indicate an abundance of juvenile rockfish during those times and over

shallow bottoms (less than 35 fathoms) (May-June Report of Activities). Juvenile rockfish were not caught in the same area in late June. (T. Wyllie Echeverria, FTS 556-0565)

Widow Rockfish Stock Assessed

Drs. William H. Lenarz and Joseph Hightower, Fishery Biologists with the Groundfish Analysis Investigation, and Biological Technician David Woodbury have completed an assessment of the widow rockfish fishery. They conducted a cohort analysis on 1980-1984 age composition data using a PASCAL version of GENCOM written for microcomputers. Results of the analyses were used in a general simulation model, GENMOD, written in PASCAL by Hightower for microcomputers. Maximum sustainable yield was estimated to be 9,200 mt. Nine harvest strategies were examined to estimate acceptable harvest levels for the next decade. All but two of the strategies produced unacceptable fluctuations in yield or effort. Constant fishing mortality and constant yield strategies produced acceptable results. The results indicate that yields should be 9,300 mt in 1986 and probably about the same in 1987. The projections are based partially on imprecise estimates of strengths of incoming year classes, and the 1987 projection will be revised as more data become available. A report on the assessment was prepared and presented to the Groundfish Management Team of the Pacific Fisheries Management Council at its August 26-29 meeting at the Tiburon Laboratory. (W. H. Lenarz, FTS 556-0565)

Staff of the Tiburon Laboratory

From left to right: Nancy Wiley, Walburga Giguere, James Bybee (Southwest Region, Environmental Assessment Branch), Norma Smith, Jeannette Whipple, Jeanne Hurst, John Greeley, Bruce MacFarlane, Susumu Kato, Norman Abramson, Susan Smith, Peter Adams, Pete Benville, Rebecca Hoff, David Woodbury, William Lenarz, Candis Cooperrider, Tina Wyllie Echeverria, Ann McBride, Sharon Moreland, Sennen Salapare, Brian Jarvis, Rahel Fischer, Wayne Samiere, Edward Ueber, Joseph Hightower, James Chess. Kneeling, left to right: Paget Leh (Southwest Region, Environmental Assessment Branch), Lt. Howard Jemison (NOAA Corps), Lt Frederic Plotkin (NOAA Corps), and Antonio Munoz. Not in photo: Michael Bowers, Maxwell Eldridge, Edmund Hobson, Daniel Howard, William Leet, Carol Reilly, Roger Wolcott (Southwest Region, Environmental Assessment Branch), and Maureen Woods.

FISHERIES INFORMATION SYSTEMS & ADP

Information Technology Plan for the 90's Prepared

The National Marine Fisheries Service has recognized that there is a need for a nationwide information technology plan to support NMFS missions through 1995. To this end the National Data Management Committee has been organized, with membership consisting of the Regional Data Base Administrators, and given the responsibility for gathering and coordinating the information required for the plan. The committee will collect information on 1) the assessment of future mission requirements and the type of information technology support that will be needed to support those requirements, and 2) the quantitative data describing the present and future information technology environment.

To assess future requirements of the NMFS mission, Fred Brooks and Irene Nowotny of the NMFS Data and Information Management Office conducted interviews at the Southwest Fisheries Center and the Southwest Region during the week of August 5. They interviewed the management staff and program leaders on their future programmatic missions, objectives and requirements.

For the quantitative data, data managers and users completed a set of five forms which were designed to gather descriptive data on existing or planned computer applications on mainframes, minicomputers, and microcomputers. The data forms for the Southwest Fisheries Center's Laboratories and the Southwest Regional Office have been completed and returned to the Director of the Office of Data Information Management.

Based on the data gathered from all the Centers and Regions, the study team will draft a decision document, which the National Data Management Committee will review in October. (D. Roll, FTS 893-6250)

ADMINISTRATIVE ACTIVITIES

ADP Management Review Scheduled

On July 22, 1985, Darrell Tidwell, who is the NMFS Principal Reviewer for the A-76 study and Dean Brinker of NOAA, met with SWFC staff involved with ADP operations to discuss changes in the A-76 review process. These changes, which resulted from Tidwell's discussions with Jack Coleman of the Deputy Administrator's Office, were brought about because of events and technical problems with the development of the Performance Work Statement for the Southeast Fisheries Center (the Performance Work Statement was previously scheduled as Phase II under the Task Order written for the Arthur Young & Co., A-76 review).

During the meeting, Tidwell confirmed his temporary appointment as the NMFS A-76 Review Coordinator reporting to Dr. Joseph Angelovic. Tidwell discussed the plans for the ADP activities review, scheduling, and NMFS assumptions, and reviewed the current ADP activities in the Center. He also discussed the schedule for release of the A-76 freeze on full-time permanent hiring.

Tidwell held a meeting on August 12 with Executive Officer Ben Remington to develop a more detailed scheduling for the SWFC ADP Management Review (formerly ADP A-76 Review). A Management Study Team was appointed, with Remington designated as the Study Team Leader. Other members of the Team include: Attilio Coan, Oceanic Division; Richard Charter, Coastal Division; Dorothy Roll, La Jolla ADP Operations; Fletcher Riggs, Honolulu Laboratory; Gerald Hornof, SWR coordinator; and Carolyn Riley-Payne, WASC Personnel. The ADP Management Review began on August 26, 1985, and a final report is due on February 15, 1986. In general, the review will follow the outline detailed in the A-76 Circular. A mid-term review and progress report are scheduled for December 2, 1985.

MISCELLANEOUS

PUBLIC AFFAIRS

Pacific Fisheries Environmental Group

August 5 - The name of the Pacific Environmental Group has been officially changed to Pacific Fisheries Environmental Group (PFEG).

PRESS RELEASE

Honolulu Laboratory

July 25 - "Research Vessel Investigates Seamount Fishery Resources."

August 29 - "NOAA Ship Completes First Leg of Research Cruise."

SEMINARS

Honolulu Laboratory

July 3 - Dr. Linda L. Hudgins, Assistant Professor of Economics, University of Notre Dame, spoke on "Expansion in the Western Pacific Skipjack Tuna Fishery, 1965-82: An International Perspective."

10 - Samuel G. Pooley, Industry Economist, spoke on "Economic Research on Hawaii's Fisheries and Seafood Markets."

La Jolla Laboratory

August 7 - Gary Smith, Deputy Regional Director, Southwest Regional Office, gave a slide presentation on two recent trips to China.

26 - Dr. Carl J. Walters, University of British Columbia, Vancouver, Canada, spoke on "Interactions between Pacific cod and herring."

Pacific Fisheries Environmental Group

July 26 - Philippe Cury, visiting scientist from France gave a seminar for members of PFEG staff entitled "Forecasting fortnightly abundance indices of the Ivorian Coast Pelagic species."

August 8 - Dr. Lou Botsford, Wildlife and Fisheries Biologist from UC Davis, presented a seminar entitled "Modeling environmental effects of Dungeness crab population variability." Dr. Botsford was accompanied by John Shenker, Bodega Marine Laboratory, Tom Powell, Division of Environmental Studies, UC Davis, and Rod Hobbs, Wildlife and Fisheries Biologist at UC Davis. They discussed applications of PFEG environmental products to California Current research problems.

HONORS AND AWARDS

Honolulu Laboratory

At a general staff meeting on July 1, 1985, Dr. George Boehlert, Acting Director, presented the following awards:

Outstanding Performance - Special Act Award:

Doris J. Alcorn
Todd T. Kassman

Outstanding Performance - Sustained Superior Performance Award:

George H. Balazs
Robert E. Bourke
Sally H. Kuba
Fletcher V. Riggs

Outstanding Performance - Quality Step Increase:

Dorothy D. Powell

Sustained Superior Performance Award:

Joan P. Draper
Alice-May Drury
Melvin J. Dutro, Sr.
Alan R. Everson
David C. Hamm
Wesley H. Higuchi
Virginia L. Ishida
Louise F. Lembeck
Ray F. Sumida
Lucille T. Tsukano

Special Act Award:

Lynn M. Hondonero
Janet L. Pappas
Stephen Ralston
Paul M. Shiota
James H. Uchiyama
Happy A. Williams
Carole A. Yukihiro

La Jolla Laboratory

Director Izadore Barrett presented awards to employees at the La Jolla Laboratory on July 3, 1985. From left to right: Roderick Leong, Sustained Superior Performance; Nancy LaRoche, Sustained Superior Performance; Anthony Sarain, Special Act; Jay Barlow, Sustained Superior Performance; Stephanie Sexton, Special Act; Kenneth Wallace, Quality Step Increase; Veronica Breda, Sustained Superior Performance; Frances Tonsich, Sustained Superior Performance; Charles Oliver, Sustained Superior Performance; Carol Kimbrell, Sustained Superior Performance; Cathy Dargan, Sustained Superior Performance; Priscilla Sloan, Sustained Superior Performance.

VISITORS

Honolulu Laboratory

July 2-29 - Dr. Takashi Sasaki, Far Seas Fisheries Research Laboratory, Shimizu, Japan, visited the Laboratory to work with the staff of the Seamount Resources Program.

29-30 - Chris Wilson, Oregon State University, visited Dr. Boehlert and others, to discuss the Laboratory's research.

30 - Ilse Hamann, Graduate Student in oceanography at the University of Washington, visited Dr. George Boehlert to discuss the Laboratory's seamount research program.

August 5-6 - Rusty Brainard, NOAA Corps Officer on detail to Pacific Fisheries Environmental Group, Monterey, California, visited Dr. George Boehlert to discuss cooperative analysis

of physical data (mostly CTD and XBT transects over Southeast Hancock) from Cromwell cruises to Hancock Seamount.

15 - Dr. Allan B. Marmelstein, Pacific Islands Administrator, U.S. Fish and Wildlife Service, visited Richard Shomura and William Gilmartin to discuss Northwestern Hawaiian Islands research activities of interest to both agencies.

28 - Don Kobayashi, Graduate Student in oceanography at the University of Hawaii, visited Dr. Boehlert to discuss squid research sampling.

La Jolla Laboratory

July 1 - Akihiko Hashimoto, Fisheries Inspector, Long Distance Fisheries Division, Tokyo, Japan, met with Izadore Barrett, Gary Sakagawa, and Reuben Lasker at the Center.

22-23 - Drs. Billo, Salzwedel, Roesner, and Cooklin, Gesellschaft fur Technische Zusammenarbeit, Lima, Peru, visited Izadore Barrett and Reuben Lasker.

August 5 - Fred Brooks and Irene Nowotny, Office of Data and Information Management, NMFS, Washington, DC, visited the Center to conduct interviews with management and program leaders for an information technology plan.

19 - Richard Shomura, Honolulu Laboratory, and Gary Smith, Svein Fougner, Howard Ness, and Steve Koplin of the Southwest Regional Office attended a meeting on trends and events in the tuna fishery.

20 - Dr. John Byrne, President of Oregon State University and former NOAA Administrator, met with John Carr, Reuben Lasker, and Michael Laurs.

Pacific Fisheries Environmental Group

July 9 - Dr. Daniel Pauly, International Center for Living Aquatic Resources Management (ICLARM), Manila, Philippines, visited with PFEG staff members regarding organization of the Tropical Demersal Recruitment workshop sponsored by OSLR/IREP to be held in Mexico in October.

9-10 - LCDR Craig Nelson attended the TOGA workshop and also visited with members of PFEG staff to discuss matters of mutual interest.

22-26 - Daniel Pauly, ICLARM, Manila, Philippines, was at the PFEG offices several times during the week discussing Cooperative Eastern Boundary Current Studies.

August 9 - Dr. R.W. Stewart, Chairman of the Committee for Climatic Change in the Ocean (CCO) met with Bakun to discuss possible interaction between CCO and OSLR.

20 - Ed Ochi from the Occupational Hazards Division of the Naval Hospital in Oakland, California, visited PFEG and talked with Rosemary Troian.

23 - Philippe Cury, ORSTOM, returned to France after a 7-month visit at PFEG.

Tiburon Laboratory

July 3 - Kristine Hagemeyer de Sanchez, Consultant, met with Sus Kato to discuss marketing shark fins.

8 - Dr. Joseph Angelovic, Deputy Administrator for Science and Technology, NMFS, Washington, DC, visited the Tiburon Laboratory for briefings on groundfish research.

16 - M. Weintraub, Los Angeles, California, visited with Sus Kato to discuss marketing underutilized species.

17 - James Meehan, NMFS, Washington, DC, Izadore Barrett, John Carr, David Mackett, of the Southwest Fisheries Center, and Gary Smith, Southwest Region, attended program reviews.

18 - Gary Galbreath, NMFS, Washington, DC, and Pete Chorney, NMFS Southwest Region, Santa Rosa, met with Norman Abramson to arrange for space at the Tiburon Laboratory.

22 - Dave Husby, NMFS Pacific Fisheries Environmental Group, Monterey, California, met with Brian Jarvis.

- Sharon Lundin, WASC Personnel, Seattle, Washington, conducted supervisory training ("Coping with Employee Emotional Problems on the Job").

23 - Tom Eley, University of California, Berkeley, Geography Department, met with Sus Kato to discuss his dissertation subject.

- Frank Henry and Dave Thomas, California Department of Fish and Game, Menlo Park, California, met with William Lenarz and Joseph Hightower to discuss cohort analysis of bocaccio and chilipepper rockfish.

24 - Eileen Ryan, Atlas Asia-Pacific, Burlingame, met with Sus Kato to discuss processing and marketing of sea urchins and other species.

26 - Angel Roco, Philippine Ministry of Trade and Industry, and F. Sarmiento, Philippine Consulate, visited Sus Kato to obtain information about shrimp fisheries and markets.

30 - Frank Henry, California Department of Fish and Game, Menlo Park, California, met with William Lenarz to discuss chilipepper rockfish cohort analysis.

August 19 - Kristine Hagemeyer and Matt Willard, Hagemeyer-Sanchez Associates, met with Ed Ueber.

26-29 - Members of the Groundfish Team and Stock Assessment Ad Hoc Committee of the Pacific Fisheries Management Council met at the Tiburon Laboratory.

MEETINGS AND TRAVEL

Honolulu Laboratory

July 1 - Acting Director George W. Boehlert conducted a staff meeting to discuss the Honolulu Laboratory program review.

1-25 - Laboratory Director Richard S. Shomura traveled to the Far East to (1) participate in the 8th Session of the Indian Ocean Fishery Commission, and meet with staff of the Food and Agriculture Organization of the United Nations (FAO) Regional Office for Asia and the Pacific in Bangkok, Thailand, (2) participate in the First Conference on Economic, Scientific, and Technical Cooperation in the Indian Ocean in the Context of the New Ocean Regime in Colombo, Sri Lanka, and (3) meet with Dr. John Gissburg, Fishery Attache, American Embassy, Tokyo, Japan, and Mr. K. Mimura, Managing Director, Japan Marine Fishery Resource Research Center, Tokyo, Japan.

26 - The first meeting of the Subcommittee on Research Needs was held to discuss the Honolulu Laboratory plans for lobster research in the coming fiscal year.

August 6-8 - Richard Shomura participated in the Western Pacific Regional Fishery Management Council (Council) members' informal session with U.S. tuna industry representatives and the 50th Council meeting in Kailua-Kona, Hawaii.

- David Hamm traveled to Kailua-Kona, Hawaii, to meet with local industry representatives and personnel from the American Samoa Office of Marine Resources who were attending the Council meeting.

12-15 - Samuel Pooley attended the 9th Regional Science conference held on Molokai where he presented a paper, "Regional

issues in Hawaii's commercial fisheries--small versus large scale capital."

17-23 - Richard Shomura traveled to (1) California to discuss tuna matters with Southwest Fisheries Center and Southwest Region personnel, and (2) Washington to participate in a net entanglement meeting at the Northwest and Alaska Fisheries Center in Seattle, Washington.

18-21 - Dr. George Boehlert traveled to the Gulf Coast Research Laboratory, Ocean Springs, Mississippi, where he presented a paper, coauthored with fishery biologist Bruce C. Mundy, "The role of behavioral and physical factors in fish recruitment to estuarine nursery areas." The paper was presented at a workshop entitled "Larval Fish and Shellfish transport through coastal inlets," which was sponsored by the U.S. Army Corps of Engineers.

La Jolla Laboratory

July 9 - Sandy Hawes traveled to Santa Barbara Island, California, to census sea lion pups, collect scat samples, and resight tagged sea lions.

7-12 - Susan Chivers, Marissa Schwartz, Richard Lindsay and Mwenda Kudumu traveled to Santa Barbara Island, California, to join the research vessel for sonic tracking at San Miguel Island, California.

7-14 - Izadore Barrett attended a World Fisheries Project Workshop in Seattle, Washington.

8-9 - John Carr attended a SWR/SWFC constituents review of the West Coast Groundfish Fishery.

8-11 - Paul Smith traveled to Annapolis, Maryland, to make a presentation at a workshop on Biology and Target Acoustics of Marine Life, sponsored by ONR and Navy Research and Development.

10-11 - Dan Huppert and Alec MacCall went to Los Angeles, California, to present anchovy fishery information and biomass estimates to the Pacific Fishery Management Council and Anchovy Advisory Subpanel.

14-19 - Randy Rasmussen, Sandy Hawes, and Susan Chivers traveled to Santa Barbara Island, California, to join the research vessel for sonic tracking at San Miguel Island, California.

14-29 - Jeanne Wexler traveled to Santa Barbara Island, California, to join the research vessel for sonic tracking at San Miguel Island, California, and to assist in the peak pup census for California sea lions on San Miguel Island, California.

15-18 - Izadore Barrett, John Carr, David Mackett, and Robert Siegel traveled to Monterey and Tiburon, California, to conduct Program Reviews.

22 - Izadore Barrett, John Carr, and David Mackett traveled to Terminal Island, California, to discuss MBO milestones.

25-29 - Chuck Oliver conducted annual peak pup counts of California sea lions on San Clemente Island, California.

July 28- August 2 - Wayne Perryman assisted in harbor seal tagging and a tracking experiment at Pt. Reyes, California.

July 29- August 2 - Izadore Barrett traveled to St. Louis, Missouri, to attend an NMFS Research Council and Directors' meeting.

August 2-5 - Jeanne Wexler traveled to San Clemente Island, California, to obtain a complete pup count for California sea lions, counts of other pinnipeds, and scat, tag resight, and salvage information.

5-8 - Nancy Lo attended the American Statistical Meetings in Las Vegas, Nevada. She presented an invited paper on the "Use of Statistics in Anchovy Management on a Real-Time Basis."

5-9 - Paul Smith presented a Review of Mediation Effort on Seismic Effects on Fisheries at Lake Tahoe, California.

13-20 - Albert Myrick and Aleta Hohn traveled to Edmonton, Alberta, Canada, to attend the 4th International Theriological Congress and to present an invited paper.

19 - John Carr attended a meeting in Sacramento, California, with California Department of Fish and Game officials and the Southwest Regional Director about Harbor porpoise and other coastal marine mammal issues.

19-25 - Jay Barlow attended a workshop on marine debris and entanglement problems in Seattle, Washington.

19-30 - Michael Laurs traveled to Corvallis, Newport, and Astoria, Oregon, to conduct cooperative research with scientists at Oregon State University on salmon/oceanography/satellite projects.

23-29 - Mark Lowry traveled to San Nicolas Island, California, to census sea lions and collect scats.

25-29 - David Mackett attended a meeting on tuna program planning in Miami, Florida.

26-29 - Gary Sakagawa, Norman Bartoo, and David Au attended a pre-ICCAT meeting in Miami, Florida.

26-30 - Paul Smith traveled to Halifax, Nova Scotia, Canada, to serve as an External Examiner for a Ph.D. Thesis, at Dalhousie University Faculty of Graduate Studies, Department of Oceanography, and also to present a seminar, "Recruitment and Measurement of Fish Populations."

28-30 - John Hunter attended a groundfish meeting in Seattle, Washington.

Pacific Fisheries Environmental Group

June 30-July 3 - David Husby traveled to Santa Cruz to attend the Antarctic Marine Ecosystems Research at the Ice Edge Zone Workshop and precruise meeting for his cruise to the Antarctic in March of 1986.

July 9-10 - Doug McLain helped FNOC to host an Ocean Thermal Workshop for the Tropical Ocean-Global Atmosphere Research Program. He gave a talk entitled "Ocean Thermal Data Processing at FNOC."

16 - Izadore Barrett, John Carr, David Mackett from Southwest Fisheries Center, La Jolla, California, and James Meehan and Robert Siegel from Washington, DC, attended program reviews at PFEG.

July 29-August 2 - Roy Mendelssohn traveled to Humboldt State University in Arcata, California, to attend the AMS-IMS-SIAM Joint Summer Research Conferences in the Mathematical sciences (Function estimates).

August 13-15 - Andy Bakun was in Washington, DC, attending the first meeting of the PIPICO subpanel for the OSLR Program.

30 - Dr. Roy Mendelssohn has begun a 4-month assignment at the Honolulu Laboratory.

Tiburon Laboratory

July 9 - Norman Abramson attended a coastwide groundfish constituents meeting in Los Angeles, California.

18-22 - Sus Kato traveled to Santa Barbara Island, California, to board the commercial trawler Gus D to collect specimens of various underutilized species and to experiment with methods for maintaining quality of frozen shrimp. He also helped a crew from Fuji Television of Japan in the filming of some aspects of fishing and use of underutilized species. The film is to be shown on Japanese national television as part of a network news program in August.

25 - Norman Abramson met with Floyd Anders, NMFS Southwest Region, in Santa Rosa, California, and visited Warm Springs Dam and Hatchery.

August 8 - Norman Abramson and Sus Kato attended the Vietnamese Fishermen's Association open house in Oakland, California, and discussed alternative fisheries and fishing methods.

29-30 - Norman Abramson attended a meeting in Seattle, Washington, to outline a strategic groundfish plan.

PERSONNEL ACTIONS

Honolulu Laboratory

July 7 - Russell Y. Ito, Biological Technician (Fisheries) - Full-Time Temporary Appointment.

25 - Julie A.K. Lelaloha, Biological Technician (Wildlife) - Full-Time Temporary Appointment.

26 - Alan K.H. Kam, Biological Technician (Wildlife) - Termination.

- Gail A. Peiterson, Biological Technician (Wildlife) - Termination.

August 12 - Susan T. Tanaka, Data Transcriber - Part-Time Temporary Appointment.

- Thomas W.K. Weber, Scientific Illustrator - Full-Time Permanent Appointment.

16 - Linda L. Hudgins, Industry Economist - Resignation.

21 - Miriam B. Pillos, Biological Science Student Trainee (NOAA Junior Fellow) - Leave Without Pay.

28 - Robin L. Westlake, Biological Technician (Wildlife) - Extension of Temporary Appointment.

30 - Marlene W.L. Dung, Computer Clerk - Resignation.

La Jolla Laboratory

New Employees Begin Studies at La Jolla Laboratory

Dr. Michael Prager recently joined the Coastal Fishery Resources Division staff to conduct a biostatistical time-series study of biological, environmental, and contaminant effects on southern California fish production. Prager is at the Center under an Inter-governmental Personnel

Agreement from Old Dominion University in Norfolk, Virginia. He received his Ph.D. in oceanography from the University of Rhode Island and has been conducting fishery and habitat studies of Chesapeake Bay resources (e.g., striped bass and blue crab). The two-year, biostatistical study is funded by NOAA's National Ocean Service, Coastal and Estuarine Assessment Branch.

Also joining the Coastal Fishery Resources Division staff is Randall M. Peterman, who is on sabbatical from Simon Fraser University Burnaby, British Columbia, Canada. While at the Center, Peterman will be building simulation models to quantify the probability of recruitment failure for clupeid fishes, which have varied life history strategies, inhabit different environments, and are subjected to various fishing regimes.

Peterman received his Ph.D. from the Institute of Animal Resource Ecology, University of British Columbia. For the past 14 years he has been building empirically based simulation models of ecological systems, with a focus on management applications. His research over the past 11 years has been concentrated on fish population dynamics. His work in La Jolla is partly funded by a National Research Council (Washington, DC) Research Associateship.

Working with Peterman is Michael J. Bradford, who will help to construct simulation models of clupeid population dynamics. Bradford is currently completing his M.Sc. on otolith daily growth increments from the Department of Biological Sciences, Simon Fraser University, Burnaby, British Columbia. He has several years of experience with Canadian and International fisheries management agencies. His work is funded by the Natural Sciences and Engineering Research Council of Ottawa, Canada.

New employees (from left to right) Michael Bradford, Randall Peterman, and Michael Prager.

July 15 - Michael Prager, Operations Research Analyst (IPA) - Entered on Duty.

- Daniel Martin, Biological Aid - Entered on Duty.

16 - Denise Fuhrman, Computer Assistant - Entered on Duty.

19 - Anthony Sarain, Computer Aid - Resignation.

August 23 - James Ryan, Biological Aid - Resignation.

- Daniel Martin, Biological Aid - Resignation.

- Diana Eades, Clerk Typist - Resignation.

- Anne Mahan, Clerk - Resignation.

28 - Patricia Wilkins, Clerk Typist - Resignation.

30 - Roberta Folk, Junior Fellow - Resignation.

31 - Tim Smith, Fishery Biologist - Transferred to Woods Hole, Massachusetts Laboratory.

La Jolla Participates in Summer Employment Program

Six high school students from Clairmont, California, worked at the La Jolla Laboratory during the summer as laboratory technicians and computer aids. The students were placed at the Laboratory through the Harvey Mudd College Upward Bound Program, a federally-funded program to help highly motivated and talented high school students from low income families successfully pursue a college education. The students worked 20 hours each week from July 1 through August 2.

Through the Regional Youth Employment Program (REGY), two students worked at the Center as a computer aid and as a biological aid. The REGY program is a state funded program to enhance the prospect of future employability by providing career orientation with paid work experience. These students worked 30 hours each week from June 24 through August 21, 1985.

Pacific Fisheries Environmental Group

August 30 - Kris Baird, Summer Aid - Returned to School.

Tiburon Laboratory

July 5 - Lt. Howard A. Jemison (NOAA Corps) - Entered on Duty.

August 2 - Lt. Frederick Plotkin (NOAA Corps) - Resignation.

14 - Wayne Samiere, Biological Aid - Extension of Temporary Appointment (NTE one-year).

TRAINING

Tiburon Laboratory

July 22 - Supervisory Training, "Coping with Employee Emotional Problems on the Job" - Sharon Lundin, WASC Personnel, Seattle, Washington.

August 20 - Brian Jarvis, Biological Technician - Computer Technology, Control Data Institute, San Francisco, California.

STATUS OF PUBLICATIONS

Published

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Balazs, G.H. and W.G. Gilmartin. 1985. A suggested modification of tagging pliers. Mar. Turtle Newsl. 34:2-3.

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Brainard, Russell and D.M. McLain. 1985. Subsurface temperature variability along the west coast of North and South America. Tropical Ocean-Atmosphere Newsletter, May issue.

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Humphreys, R.L., Jr., and D.T. Tagami. 1985. Kusakari tsubodai no seibutsugaku, seitaigaku ni kansuru kenkyū no genjō. [Review and present status of biological research on pelagic armorhead.] [Abstr.] [In Jpn.] Bull. Jpn. Soc. Fish. Oceanogr. 47-48:170-171.

Seki, M.P., and D.T. Tagami. 1985. Kinmedai wo shutaisho to suru tezuri, soko-haenawa gyogyo no genjo. [Review of present status of handline and bottom longline fisheries for alfonsin.] [Abstr.] [In Jpn.] Bull. Jpn. Soc. Fish. Oceanogr. 47-48:166.

Wetherall, J.A., and M.Y.Y. Yong. 1985. Kita Taiheiyō chūbu no kaizan ni okeru kusakari tsubodai no shigen wo hyōka suru uede no mondaiten. [Review and present status of research on assessment of pelagic armorhead stock.] [Abstr.] [In Jpn.] Bull. Jpn. Soc. Fish. Oceanogr. 47-48:180.

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Au, David W.K. and Robert L. Pitman. Seabird interactions with dolphins and tuna in the eastern tropical Pacific. For consideration for publication in The Condor.

Boehlert, G.W., and B.C. Mundy. The role of behavioral and physical factors in fish recruitment to estuarine nursery areas. For consideration for publication in Trans. Am. Fish. Soc.

MacFarlane, R.B. and P.E. Benville, Jr. Primary and secondary stress responses of striped bass (Morone saxatilis) exposed to benzene. For consideration for publication in Mar. Biol.

Polovina, J.J. Assessment and management of deepwater bottom fishes in Hawaii and the Marianas. Proceedings on The Biology and Fishery Management of Snappers and Groupers in the Tropics.

Polovina, J.J. R.B. Moffitt, S. Ralston, P.M. Shiota, and H.A. Williams. Results of the resource assessment investigation of the Mariana Archipelago, 1985. Mar. Fish. Rev.

Shomura, R.S., and H.O. Yoshida (editors). Proceedings of the Workshop on the Fate and Impact of Marine Debris, 26-29 November 1984, Honolulu, Hawaii. U.S. Dept. Commer., NOAA Tech. Memo. NMFS, NOAA-TM-NMFS-SWFC.

Smith, R.C., P. Dustan, D. Au, K.S. Baker, and E.A. Dunlap. Distribution of cetaceans and sea surface chlorophyll concentrations in the California Current. For consideration for publication in Marine Biology.

Squires, Dale. Ex-vessel price linkages in the New England fishing industry. For consideration for publication in Fishery Bulletin, U.S.

Translation

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Samples, K.C., and D.M. Schug. 1985. Charter fishing patrons in Hawaii: A study of their demographics, motivations, expenditures and fishing values. Southwest Fish. Cent. Admin. Rep. H-85-8C.

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